

FUNCTIONAL BALANCED-LETHAL HOST-VECTOR SYSTEMSAbstract

The invention encompasses methods of maintaining desired recombinant genes in a genetic population of cells expressing the desired gene. The methods utilize microbial cells that have an inactivating mutation in a native essential gene encoding an enzyme which catalyzes a step in the biosynthesis of diaminopimelic acid (DAP). The cells also have an extrachromosomal vector that includes the desired gene and which is capable of homologous recombination with a chromosome of the microorganism. The vector also has a recombinant complementing gene encoding a functional replacement of the native essential gene. The cells of the invention are particularly useful for components of vaccines, including DNA vaccines.